Your Name: _____ Date: _____

Students' Investigation of a View Tube by Samuel Obara
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Abstract:
Using multiple representations and technology, students explore the relationship between tube attribute and field of vision.

Given a view tube
How wide is your field of vision when you look through a tube, such as a paper towel tube or a toilet roll tube?
Consider the following variables: The length of the tube, the diameter of the tube, and your distance from your eye to the wall.

1. **Vary the length of the tube**: Investigate the relationship between the length of the view tube (x) and the viewable vertical distance on the wall (y) while maintaining a perpendicular line from the eye to the wall and keeping the diameter of the view tube constant. Use view tubes of different lengths for comparison.

Begin by predicting a mathematical relationship between the length of the tube and the width of your field of vision:

2. **Vary the distance to the wall:** Investigate the relationship between the perpendicular distance from the eye to the wall (x) and the viewable vertical distance on the wall (y) using a view tube of constant length and diameter.

Begin by predicting a mathematical relationship between the distance to the wall and the width of your field of vision:

3. **Vary the diameter of the tube**: Investigate the relationship between the diameter of the view tube (x) of constant lengths and the viewable vertical distance on the wall (y) while keeping the perpendicular distance from the eye to the wall constant. Use view tubes of different diameters for comparison.

Begin by predicting a mathematical relationship between the diameter of the tube and the width of your field of vision:

Your Name: _____ Date: _____

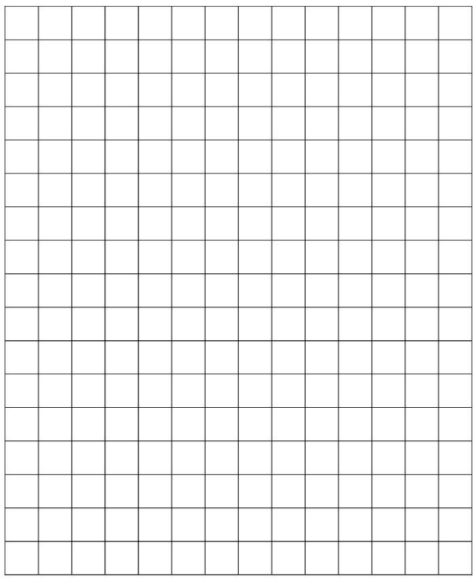
1. Data Collection:

Distance eye to the wall: _____ cm

Diameter of the tube: _____ cm

Length of the tube (cm)	Vertical viewing distance (cm)

Generate a graph:



Your Name: _____ Date: _____

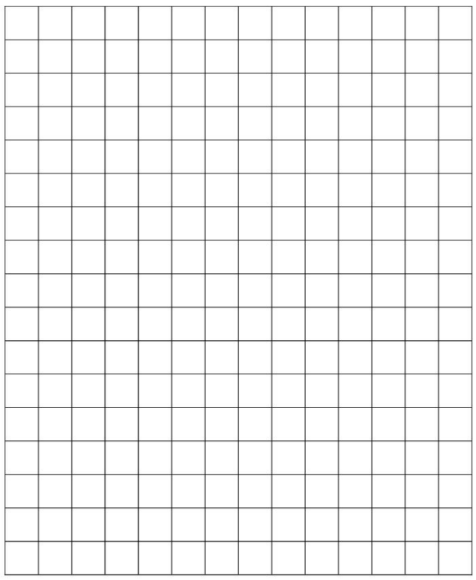
2. Data Collection:

Length of tube: _____ cm

Diameter of the tube: _____ cm

Distance of eye to wall (cm)	Vertical viewing distance (cm)

Generate a graph:



Your Name: _____ Date: _____

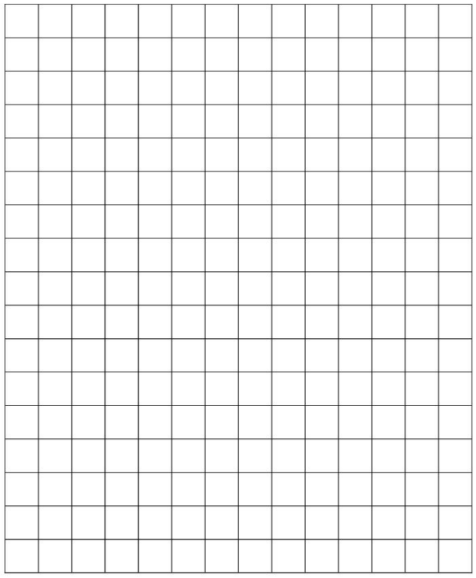
3. Data Collection:

Distance eye to the wall: _____ cm

Length of the tube: _____ cm

Diameter of the tube (cm)	Vertical viewing distance (cm)

Generate a graph:



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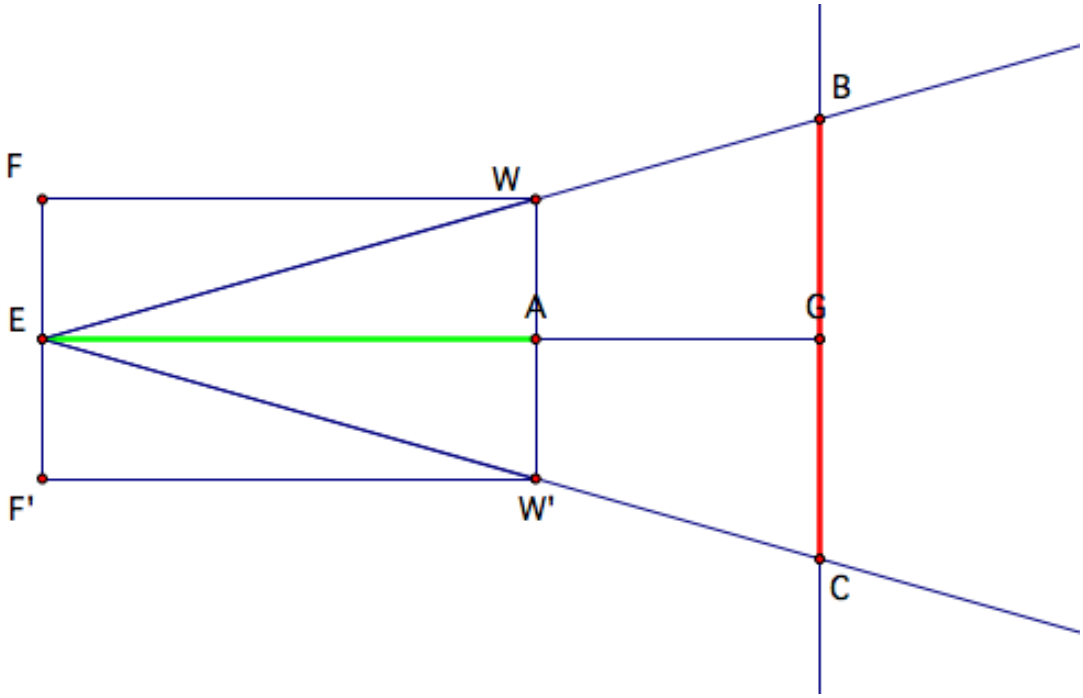
Construct a mathematical model that describes the relationship between the length, x, of the tube (EA) and the vertical viewing distance, y (BC) for a tune with diameter WW', and the eye distance from the eye to the wall EG.



For a deep discussion of the related model see the article by the author linked on the course wikipage.